920476-904712

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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| In the application of | : | Brian M. Unitt |
| Serial No. | : | 09//375,710 |
| Filed | : | August 17, 1999 |
| For | : | Packet Communication System and Method |
| Examiner | : | Andrew Waxman |
| Art Unit | : | 2667 |



I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450," on March 29, 2004
Name of person signing Jennifer J. Ramirez
Signature

## BRIEF ON APPEAL

This appeal is being lodged to appeal the examiner's final rejection dated October 28, 2003. A timely Notice of Appeal was filed with the Patent and Trademark Office by mail on January 28, 2004.

This appeal is being filed in triplicate, with the required fee of $320 pursuant 37 C.F.R. §1.17(c). As March 28, 2004 was a Sunday, this paper is timely.

### (1) Real Party in Interest

This application is assigned to Nortel Networks Limited. The assignment is recorded at Reel 010295, Frame 0735.

### (2) Related Appeals and Interferences

There are no related appeals or interferences.

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## (3) Status of Claims

This application was filed with claims 1 through 15 of which claims 1, 2 & 15 were amended, claims 3 to 9 retained as filed and claims 10 to 14 cancelled. New claims 16 to 23 were added by way of amendment subsequent to filing. Consequently, it is the rejection of claims 1 to 9 & 15 to 23 that is appealed. The claims as currently pending are set forth in Appendix A.

## (4) Status of Amendments

A paper entitled "Response to Office Action Mailed April 23, 2003" was filed July 22, 2003 and entered by the Examiner. The amendment of that response comprised amendment of page 6, lines 9 to 25 and page 7, lines 8 to 17 of the description and the amendment of claims 1, 2 & 15, the cancellation of claims 10 to 14 and the addition of new claims 16 to 23.

A paper entitled "Response to Office Action Mailed October 28, 2003" was filed December 29, 2003. No amendment of the description or claims was made.

## (5) Summary of the Invention

The present invention is directed to utilizing an existing low bandwidth upstream communication path from a subscriber location, such as a twisted copper pair (subscriber loop), to transmit as respective packet streams both voice and data traffic (e.g. internet access) simultaneously from the subscriber location to an access multiplexer of a high bandwidth IP network, for example. At the subscriber location,

both the subscriber's upstream voice and data traffic flows are separately converted into respective internet protocol (IP) packets streams. A problem with IP is that IP packets can be very long, relatively speaking. As such, multiplexing the separate IP packet streams comprising the voice and data traffic flows respectively to transmit them on the low bandwidth upstream path of the subscriber loop can lead to unacceptable delays in voice IP packets being despatched on the subscriber loop upstream path. Such packet transmission delays can cause voice calls to suffer interference such as echoing or for the voice connection to be compromised to the degree that conversation becomes impossible. The low bandwidth of the upstream path of the subscriber loop accentuates the transmission delay problem which is not an issue in the high bandwidth (high speed) IP network.

The present invention addresses this problem by processing the IP packets at the subscriber location. At the subscriber location, the IP packets of the respective voice and data traffic IP packet streams are separately segmented into respective ATM cell streams and then the resultant streams of shorter ATM cells are multiplexed for transmission on the low bandwidth upstream communication path of the subscriber loop to the access multiplexer of the high bandwidth IP network. The conversion of the voice and data traffic streams at the subscriber location from long IP packets to shorter ATM packets limits the potential transmission delay of an ATM voice traffic packet on the low bandwidth upstream communication path. Also, the ATM voice traffic packets can be given transmission priority over the ATM data traffic packets.

The present invention therefore provides a solution to a problem encountered in the upstream communication paths of low bandwidth local subscriber loop access networks such as digital subscriber line (DSL) enabled twisted copper pairs.

## (6) Issues

The following issues are presented:

**1.** The rejection of claims 1 to 6 and 15 to 23 under 35U.S.C. 103(a) as being un-patentable over Brueckheimer et al (US 6519261) in view of DeNap et al (US 6490273); and

**2.** The rejection of claims 7 to 9 under 35U.S.C. 103(a) as being un-patentable over Brueckheimer in view of DeNap and Bergenwall (US 6463082).

## (7) Grouping of Claims

Claims 1 to 9 & 16 to 23 can be considered as a group, with claim 1 being representative of the group.

## (8) Argument

Referring to issue 1, Brueckheimer proposes an inter-working function for adaptation of communications traffic into selected asynchronous transfer mode (ATM) formats from time division multiplex (TDM) (connection-oriented) networks and from data, e.g. IP (connectionless), networks. Thus, Brueckheimer teaches an interface between three types of networks (col 5, lines 9 to 16), namely an ATM network as an overlay network and a time division multiplex (TDM) (connection-oriented) network and a data (connectionless) network.

In the arrangement of Brueckheimer, traffic may pass directly between a TDM framing circuit 13, an adaptation (ATM) processor 11 and an IP framing circuit 15 for

data only services. For all other traffic including voice, traffic is passed via a Codec 17 for further voice/data servicing (col 5, lines 46 to 49 and claim 9).

Brueckheimer therefore is a solution for integrating communications networks (see for example col 4, lines 30 to 33, col 6, lines 15 to 20 & col 6, line 60 though to col 7, line8).

In contrast with the present invention, Brueckheimer does not disclose **i)** transporting communications traffic over a low, bandwidth upstream communication path from a subscriber location such as an upstream path of a subscriber loop; **ii)** at a subscriber location, separately converting voice and data traffic to respective IP packet streams; **iii)** at the subscriber location, separately segmenting the voice and data IP packet streams to respective ATM cell streams; and **iv)** at the subscriber location, multiplexing the ATM cell streams for transmission on the low bandwidth upstream communication path from the subscriber location.

The above serves to highlight just how considerably different the communication arrangement of the present invention and its application are from those of Brueckheimer in that the present invention is directed to access problems connected with a low bandwidth upstream communication path from a subscriber location and not to the integration of different communications networks under an ATM overlay network.

DeNap is directed to a series of architectures that are implemented in phases to provide a migration path from an initial ATM service offering to a full service ATM network. DeNap does disclose an ATM interface with both data and voice flowing into the device. It also discloses an embodiment with an XDSL/ATM interface. However, DeNap makes no suggestion of, at a subscriber location, converting voice traffic to an IP packet stream, to then separately segmenting the voice packet IP

stream and a data traffic IP packet stream to respective ATM cell streams and to multiplexing these cell streams for transmission on an ATM enabled link.

To establish a prima facie case of obviousness, three basic criteria must all be met:

A) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings;

B) there must be a reasonable expectation of success; and

C) the references when combined must teach or suggest all the claims limitations.

Considering A), the Examiner suggests that the motivation for including the method for the networking system of DeNap into the system disclosed by Brueckheimer is *"to provide a full service ATM network serving specific markets in a simple cost effective manner"*. The applicant is of the view that a skilled person would not be motivated to combine DeNap and Brueckheimer since DeNap addresses the issue of how to migrate an end user such as an individual or a business to a full ATM network service through phases but ignores entirely the conflict that can occur between voice and data traffic transmission on a low bandwidth upstream communication path on a subscriber loop. In the case of Brueckheimer, this disclosure addresses the issue of how to integrate a TDM network and a data network under an overlay ATM network and equally ignores the local upstream access issue addressed by the present invention. There is therefore nothing in DeNap or Brueckheimer that would lead a skilled person to seriously contemplate combining the teachings of these references.

Considering B), a skilled person would readily comprehend that DeNap addresses a subscriber side of an ATM network whereas Brueckheimer addresses an inter-network connection of an ATM network with a data network and a TDM

network. Therefore, even if it were contemplated to combine the teachings of DeNap and Brueckheimer, the skilled person would connect the network arrangement as taught by DeNap to a subscriber side of the ATM network (ATM network cloud, figure 1, Brueckheimer) of Brueckheimer and not in the midst of the inter-working interface that forms the 'junction' between the ATM network, the data network and the TDM network as taught by Brueckheimer. Consequently, there can be no expectation that a combination of Brueckheimer and DeNap would result in an upstream communication path transmission system as claimed.

Considering C), neither Brueckheimer nor DeNap teaches, at a subscriber location, converting voice traffic to an IP packet stream, to then separately segmenting the voice packet IP stream and a data traffic IP packet stream to respective ATM cell streams and to multiplexing these cell streams for transmission. Therefore, these references do not teach all of the claim limitations.

Consequently, none of the three criteria for establishing obviousness have been met.

In the recently issued Advisory Action, the Examiner has suggested that the apparatus taught by Brueckheimer is essentially a "subscriber location" as described by the claim language (of the currently pending claims). This has conveniently enabled the Examiner to not specifically address the substance of the foregoing arguments thus enabling the Examiner to maintain his rejection of claims 1 to 9 & 16 to 23 as being un-patentable over Brueckheimer in view of DeNap. The applicant respectfully disagrees with this broad interpretation of the term "subscriber location".

It is accepted by the applicant that, in assessing the relevance of prior art teachings, the Examiner may construe the meanings of words or terms in the examined claims broadly. However, this is conditional on the words or terms being given their plain meaning (unless defined otherwise in the specification), i.e. the

meanings that would be given to such words by those of ordinary skill in the art, and that the broadest reasonable interpretation of the words must be consistent with the interpretation that those skilled in the art would reach.

It is apparent that the Examiner has given the term "subscriber location" the broadest possible interpretation without regard to what would be understood by one skilled in the art as a mechanism for maintaining his grounds of rejection based on the Brueckheimer and DeNap references. In the context of the present application, the term "subscriber location", particularly when construed in light of another limitation of the claims that the upstream communication path from the subscriber location is a low bandwidth path, would readily be understood to relate to a subscriber location served by a low bandwidth path such a local access loop and not an apparatus at a junction of an ATM network with a data network and a TDM network as taught in Brueckheimer. It cannot be argued then that Brueckheimer teaches a "subscriber location" as would be understood in the context of the present application and thus the Examiner's reliance on this prior art reference as disclosing the majority of the features of the present invention is flawed and cannot be sustained.

The claims as currently pending in the application are not rendered obvious by the combined disclosures of Brueckheimer and DeNap for the many reasons set out in the foregoing.

Referring now to issue 2, since claims 7 to 9 comprise dependent claims, the rejection of these claims under 35U.S.C. 103(a) is moot in view of the foregoing.

March 29, 2004

Respectfully submitted,

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## APPENDIX A

**Claims**

1. A method of transporting packet voice and data traffic over a low bandwidth upstream communication path from a subscriber location, the method comprising performing at the subscriber location the steps of:- generating a first internet protocol (IP) packet stream carrying the voice traffic; generating a second IP packet stream carrying the data traffic; segmenting said first and second IP packet streams into respective first and second ATM cell streams; and multiplexing said first and second ATM cell streams together for transport over said upstream communication path.

2. A method as claimed in claim 1, wherein said upstream communication path comprises a telephone subscriber loop.

3. A method as claimed in claim 2, wherein said subscriber loop carries a asymmetric digital subscriber line (ADSL) service.

4. A method as claimed in claim 3, wherein said first and second cell streams are adaptation layer five (AAL5) cell streams.

5. A method as claimed in claim 4, wherein said first and second cell streams are re-assembled into respective voice and data packets for transport over an IP network.

6. A method as claimed in claim 5, wherein said voice packets are routed within the IP network to one or more gateways providing access to a PSTN.

7. A method as claimed in claim 6, wherein each said voice packet is provided with a compressed header.

8. A method as claimed in claim 7, wherein compressed header packets directed at a common gateway are embedded in an IP packet having a full header.

9. A method as claimed in claim 7, wherein compressed header packets directed at a common gateway are embedded in a single ATM virtual circuit.

15. A subscriber station for providing digital communication with an access multiplexer over a subscriber loop, the subscriber station incorporating means for generating a first IP packet stream comprising digitally encoded voice traffic and a second IP packet stream comprising data traffic, means for segmenting said first and second IP packet streams into respective first and second ATM cell streams, and multiplexing means for multiplexing said first and second ATM cell streams together for transport to the access multiplexer over said subscriber loop.

16. A method of transporting packetised delay sensitive and delay insensitive traffic on a low bandwidth, upstream communications path from a subscriber location, said method comprising performing at the subscriber location the following steps:-

generating a first packet stream carrying the delay sensitive traffic according to a first packet protocol;

generating a second packet stream carrying the delay insensitive traffic according to said first packet protocol;

segmenting said first and second packet streams to form respective first and second packet streams in accordance with a second packet protocol;

multiplexing said first and second packets streams formed in accordance with said second packet protocol for transport over the upstream communications path, wherein said second packet protocol has a packet length that is smaller than that of the first packet protocol.

17. A method according to claim 16, wherein the first packet protocol is the Internet Protocol (IP) and the second protocol is the Asynchronous Transfer Mode (ATM) protocol.

18. A method according to claim 16, wherein said upstream communication path is a subscriber loop carrying an asymmetric digital subscriber line (ADSL) service.

19. A method according to claim 16, wherein said first packet stream comprising said delay sensitive traffic comprises digitally encoded voice traffic and said second packet stream comprising said delay insensitive traffic comprises data traffic.

20. A method according to claim 19, wherein each voice packet comprising the digitally encoded voice traffic is provided with a compressed header.

21. A subscriber installation for providing digital communication with an access multiplexer over a low bandwidth, upstream communication path, comprises:-

means for generating a first packet stream comprising delay sensitive traffic, said first packet stream being generated in accordance with a first packet protocol;

means for generating a second packet stream in accordance with said first packet protocol comprising delay insensitive traffic;

means for segmenting said first and second packet streams in accordance with a second packet protocol;

a multiplexer for multiplexing said first and second cell streams for transport over said upstream communications path,

wherein the first packet protocol has a packet length greater than that of the second packet protocol.

22. A subscriber installation according to claim 21, wherein the first packet protocol is IP and the second packet protocol is ATM.

23. A subscriber installation according to claim 21, wherein the upstream communications path comprises a subscriber loop carrying an ADSL service.